

AMENDMENTS TO THE CLAIMS:

1-19. (Cancelled).

20. (New) An apparatus for time synchronization and code identification for cell detection in an orthogonal frequency division multiplexing (OFDM) based cellular communication system, said apparatus comprising a time-domain frame structure having a plurality of OFDM symbols, wherein at least one of said OFDM symbols has a guard interval and a periodic signal pattern for detecting frame timing and code identification, and at least one of said OFDM symbols comprises cell code information in a common pilot channel (CPICH) signal of a cell code.

21. (New) The apparatus for time synchronization and code identification as claimed in claim 20, wherein each of said OFDM symbols comprises  $N_{OFDM}$  samples including  $N_{GI}$  samples of cyclic prefix (CP) in a guard interval and  $N_{FFT}$  samples of data, and said at least one OFDM symbol having a periodic signal pattern is an  $i$ th OFDM symbol represented by  $CPICH_i$  in which said periodic signal pattern comprises  $N_i$  repetitive duplicates of a  $v_i$ -point short sequence, wherein  $N_{FFT} = v_i \cdot N_i$  and  $N_i \geq 1$ .

22. (New) The apparatus for time synchronization and code identification as claimed in claim 20, wherein said plurality of OFDM symbols further include at least one OFDM symbol having a traffic channel (TCH) signal, or another OFDM symbol having another common pilot channel (CPICH) signal, and TCH and CPICH signals are allocated in different OFDM symbols.

23. (New) The apparatus for time synchronization and code identification as claimed in

claim 20, wherein said plurality of OFDM symbols include at least one OFDM symbol comprising information of a cell code represented by two sequences.

24. (New) The apparatus for time synchronization and code identification as claimed in claim 20, wherein at least one of said OFDM symbols comprises repetitive duplicates of a  $\nu$ -point time domain short sequence, said  $\nu$ -point time-domain short sequence being obtained by taking  $\nu$ -point inverse discrete Fourier transform (IDFT) or inverse fast Fourier transfer (IFFT) of a frequency-domain short sequence.
25. (New) The apparatus for time synchronization and code identification as claimed in claim 20, wherein at least one of said OFDM symbols comprises repetitive duplicates of a first  $\nu$ -point time domain short sequence and at least another of said OFDM symbols comprises repetitive duplicates of a second  $\nu$ -point time domain short sequence, said first and second  $\nu$ -point time-domain short sequences being obtained by taking  $\nu$ -point inverse discrete Fourier transform (IDFT) or inverse fast Fourier transfer (IFFT) of first and second frequency-domain short sequences respectively.
26. (New) An apparatus for time synchronization and code identification for cell detection in an orthogonal frequency division multiplexing (OFDM) based cellular communication system, said apparatus comprising a time-domain frame structure having a plurality of OFDM symbols each including a guard interval and a signal pattern, wherein a portion of the signal pattern of one of said OFDM symbols is identical to a portion of the signal pattern of at least another of said OFDM symbols with the identical portions of the signal patterns forming a periodic pattern, and at least one of said OFDM symbols comprises cell code information in a common pilot

channel (CPICH) signal of a cell code for detecting frame timing and code identification.

27. (New) The apparatus for time synchronization and code identification as claimed in claim 26, wherein said plurality of OFDM symbols further include at least one OFDM symbol having a traffic channel (TCH) signal, or other OFDM symbols having other common pilot channel (CPICH) signals, and TCH and CPICH signals are allocated in different OFDM symbols.

28. (New) The apparatus for time synchronization and code identification as claimed in claim 26, wherein said plurality of OFDM symbols include at least one OFDM symbol comprising information of a cell code represented by two sequences.

29. (New) An apparatus for time synchronization and code identification for cell detection in an orthogonal frequency division multiplexing (OFDM) based cellular communication system, said apparatus comprising a time-domain frame structure having a plurality of OFDM symbols each including a regular guard interval and a signal pattern, and at least two consecutive OFDM symbols having a common guard interval followed by two identical signal patterns with said common guard interval having a length equal to the length of two regular guard intervals, wherein at least one of said OFDM symbols comprises cell code information in a common pilot channel (CPICH) signal of a cell code for detecting frame timing and code identification.,

30. (New) The apparatus for time synchronization and code identification as claimed in claim 29, wherein said plurality of OFDM symbols further include at least one OFDM symbol having a traffic channel (TCH) signal, or other OFDM symbols

having other common pilot channel (CPICH) signals, and TCH and CPICH signals are allocated in different OFDM symbols.

31. (New) The apparatus for time synchronization and code identification as claimed in claim 29, wherein at least one OFDM symbol comprises information of a cell code represented by two sequences.